CLAIMS

We Claim:

1. A method of generating an array, comprising:

a) providing: i) a solid support comprising a plurality of positions for oligonucleotides, said positions defined by x and y coordinates; ii) a plurality of identical oligonucleotides, each oligonucleotide comprising a sequence; and iii) a plurality of unique circular DNA templates, each circular DNA template comprising a sequence of interest and a region complementary to at least a portion of said sequence of said oligonucleotides, said sequence of interest being different for each circular template;

b) immobilizing one oligonucleotide from said plurality of identical oligonucleotides in each of said positions on said solid support to create an ordered array comprising a plurality of identical immobilized oligonucleotides;

c) adding to each immobilized oligonucleotide of said ordered array a circular DNA template from said plurality of said unique circular DNA templates under conditions such that said immobilized oligonucleotide hybridizes to said circular DNA template to create a plurality of primed circular templates, each primed circular template comprising a different sequence of interest; and

d) extending each of said primed circular templates to create an extended immobilized oligonucleotide comprising at least two copies of said sequence of interest, thereby generating an ordered redundant array.

2. The method of Claim 1, wherein said oligonucleotides are immobilized on a solid surface by a chemical linkage.

3. The method of Claim 1, wherein said oligonucleotides are immobilized on said solid surface by the 5' end of said oligonucleotides.

4. The method of Claim 1, wherein said oligonucleotides are approximately 17 bases in length.

5. The method of Claim 1 wherein said solid surface is selected from a group of materials comprising silicon, metal, and glass.

6. The method of Claim 1 wherein said immobilized oligonucleotides are attached to a complimentary nucleic acid stabilizer sequence.

7. The method of Claim 1, wherein said circular nucleic acid template is bacteriophage DNA.

8. The method of Claim 1, wherein said circular nucleic acid template is non-bacteriophage DNA.

9. The method of Claim 1, wherein said extending in step (d) is achieved with a polymerase.

10. The method of Claim 9, wherein said polymerase is selected from a group comprising *E. coli.* DNA polymerase I, a fragment of *E. coli.* DNA polymerase I, or Φ29 DNA polymerase.

11. An ordered redundant array of immobilized oligonucleotides produced according to the method of Claim 1.

12. A method of hybridizing target nucleic acid fragments, comprising:

a) providing i) the ordered redundant array of extended immobilized oligonucleotides of Claim 1; and ii) a plurality of fragments of a target nucleic acid; and

b) bringing said fragments of said target nucleic acid into contact with said array under conditions such that at least one of said fragments hybridizes to one of said extended immobilized oligonucleotides on said array.

13. A method of generating an array capable of hybridizing to fragments of a target nucleic acid, comprising:

a) providing: i) a solid support comprising positions for oligonucleotides, said positions defined by x and y coordinates; ii) a plurality of oligonucleotides, each oligonucleotide comprising a sequence complementary to a different portion of the sequence of said target nucleic acid; and iii) a plurality of corresponding circular DNA templates, each circular DNA template comprising a different portion of the sequence of said target;

b) immobilizing each of said oligonucleotides in one of said positions on said solid support to create an ordered array comprising a plurality of immobilized oligonucleotides;

c) adding to each immobilized oligonucleotide of said ordered array a corresponding circular DNA template under conditions such that said immobilized oligonucleotide hybridizes to said corresponding circular DNA template to create a plurality of primed circular templates; and

d) extending said primed circular templates to create an ordered redundant array of extended immobilized oligonucleotides, each extended immobilized oligonucleotide comprising at least two copies of said portion of said sequence of said target nucleic acid.

14. The method of Claim 13, wherein said oligonucleotides are immobilized on a solid surface by a chemical linkage.

15. The method of Claim 13, wherein said oligonucleotides are immobilized on said solid surface by the 5' end of said oligonucleotides.

16. The method of Claim 13, wherein said oligonucleotides are approximately 17 bases in length.

17. The method of Claim 13 wherein said solid surface is selected from a group of materials comprising silicon, metal, and glass.

18. The method of Claim 13 wherein said immobilized oligonucleotides are attached to a complimentary nucleic acid stabilizer sequence.

19. The method of Claim 13, wherein said circular nucleic acid template is bacteriophage DNA.

20. The method of Claim 13, wherein said circular nucleic acid template is non-bacteriophage DNA.

21. The method of Claim 13, wherein said extending in step (d) is achieved with a polymerase.

22. The method of Claim 21, wherein said polymerase is selected from a group comprising *E. coli.* DNA polymerase I, a fragment of *E. coli.* DNA polymerase I, or Φ29 DNA polymerase.

23. An ordered redundant array of immobilized oligonucleotides produced according to the method of Claim 13.

24. A method of hybridizing target nucleic acid fragments, comprising:

a) providing i) the ordered redundant array of extended immobilized oligonucleotides of Claim 13; and ii) a plurality of fragments of a target nucleic acid; and

b) bringing said fragments of said target nucleic acid into contact with said array under conditions such that at least one of said fragments hybridizes to one of said extended immobilized oligonucleotides on said array.